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REDACTED – FOR PUBLIC INSPECTION

Via Courier

April 7, 2016

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: *Special Access for Price Cap Local Exchange Carriers; AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, WC Docket No. 05-25, RM-10593

Dear Ms. Dortch:

On June 8, 2015, Windstream submitted a white paper (the Windstream Study), prepared by CostQuest Associates, purporting to update a CLEC cost study filed in the *Triennial Review* proceeding 14 years ago.[1] In particular, Windstream's study attempted to model the cost for a "hypothetical efficient CLEC" to build last-mile fiber facilities and associated IP electronics, and compared that cost against the revenue required to support a CLEC's build-out decision and against the cost of leasing equivalent facilities from ILECs.[2] The Windstream Study is fundamentally flawed. To the extent it could be fixed, it does nothing to demonstrate that ILECs have market power or, indeed, face economics that are any different from CLECs. And,

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[1] Letter from Jennie B. Chandra, Windstream, to Marlene H. Dortch, FCC, GN Docket No. 13-5, WC Docket Nos. 05-25, 15-1, RM-10593, Attachment (filed June 8, 2015) (Windstream June 8th Letter). In that same filing, Windstream submitted a white paper analyzing changes in the cost of network deployment as technology transitions from TDM to IP. *See id.*, Attachment A.

[2] Letter, *id.* at 2.

whatever the Windstream Study may stand for, it cannot support the proposition that special access rates are too high and need to be reduced or subjected to further regulation because doing so would only reduce competitive network investment.

On July 30, 2015, USTelecom filed a critique of the Windstream cost study, noting that "[n]either the cost nor the revenue assumptions underlying the analysis sufficiently reflect current marketplace realities."[3] USTelecom therefore asked the Commission not to draw conclusions regarding the feasibility of competitive network deployment, or make even interim policy decisions, based on the Windstream study.[4] USTelecom noted that although Windstream had updated certain input prices and components to reflect changes since 2002, "the broader network architecture and demand characteristics have not been updated to reflect fundamental changes over the last decade and a half."[5] Moreover, the revenue assumptions in the Windstream study are based on a single isolated service "without regard to margin contributions of additional components of the bundled service packages customers typically purchase[]" today.[6] In a detailed attachment, USTelecom identified further shortcomings in Windstream's cost study, including its failure to reflect efficient network architecture and the diverse nature of market demand and supply and to account for various recent and ongoing changes in market conditions.[7]

Despite these well-grounded criticisms, Windstream continues to rely on the CostQuest study to support its argument that high build-out costs generally preclude CLEC deployment of fiber facilities in competition with ILECs.[8] In this submission, CenturyLink therefore provides more detailed evidence showing that Windstream's analysis dramatically overstates the cost per building for a CLEC to deploy fiber, which fatally undermines the study's validity and usefulness for purposes of policymaking in this or any other docket.

The Windstream Study is fundamentally flawed. In the attached declaration, CenturyLink focuses on just one of the fundamental problems USTelecom identified in the CostQuest study: "The 20 building, 30 mile assumptions underlying CostQuest's average building cost assumption

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[3] Letter from Patrick S. Brogan, USTelecom, to Marlene H. Dortch, FCC, GN Docket No. 13-5, WC Docket No. 05-25, at 1 (July 30, 2015) (USTelecom Critique).

[4] *See id.*

[5] *Id.*

[6] *Id.*

[7] *Id.*, Attachment.

[8] *See, e.g.,* Letter from John T. Nakahata, Windstream, to Marlene H. Dortch, FCC, WC Docket No. 05-25, RM-10593, at 2 (Mar. 24, 2016).

are likely not reflective of today's marketplace."[9] In his declaration, Daniel Gordon, a Manager of Economic Costing at CenturyLink, investigated the validity of this assumption by comparing it to data regarding Zayo's U.S. fiber deployments and other publicly available information.[10]

Using this information, Mr. Gordon determined that the actual average density of potential business locations available for a CLEC to serve is three times the assumption in Windstream's study.[11] In other words, for every mile of its fiber ring, a CLEC, on average, has three times as many potential customers from which to obtain telecommunications revenues and to spread the costs of deploying the fiber ring as Windstream assumed in its study. Notably, Windstream's study provides no justification for its 20 building/30 mile assumption, other than that is what was used in the 2002 CLEC study. The Windstream Study thus fails to account for dramatic changes in the special access marketplace in the intervening years—including exploding demand for bandwidth from all types of business customers—that have expanded the addressable market that can be served by a CLEC's fiber ring.

Not surprisingly, this adjustment to the Windstream study dramatically reduces the estimated monthly cost for a CLEC to deploy fiber providing 1 Gbps capacity to each building on the ring—from approximately $2,700 to $1,000 per building.[12] At that cost, the CLEC could recover its fiber investment as long as it sells, on average, at least 50 Mbps capacity into the 10 percent of potential building locations it serves.[13] Comparing this estimated cost to average

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[9] USTelecom Critique, Attachment, at 2.

[10] *See* Attachment, Declaration of Daniel Gordon (Gordon Declaration). Beyond these modifications, Mr. Gordon's analysis used the assumptions and inputs in Windstream's study, including the costs of construction and electronics and CLEC market share. CenturyLink's use of these assumptions and inputs in Mr. Gordon's analysis does not mean that CenturyLink agrees that they are accurate or reflective of the costs a CLEC encounters in deploying fiber. CenturyLink used these Windstream assumptions and inputs only to highlight the fact that using a more realistic location density completely undermines Windstream's conclusion that CLECs cannot economically deploy their own fiber facilities.

[11] *See id.* ¶ 23. Mr. Gordon's analysis focused solely on potential demand from traditional wireline business customers, despite the fact that all providers now use their fiber rings to offer service for various other types of high-revenue customer locations, including data centers, cell towers, and mobile switching centers. *See* USTelecom Critique, Attachment, at 2-7. Thus, his analysis underestimates the potential revenues available to a CLEC to offset the cost of deploying fiber.

[12] Gordon Declaration ¶ 25. The assumption of a 10 percent market share was adopted from the Windstream Study.

[13] *Id.* ¶ 28.

monthly telecom spend of $1,730 also demonstrates that it is cost effective for a CLEC to deploy its own fiber. Mr. Gordon's analysis for three markets in the Pacific Northwest of varying size yielded similar results. In each of these medium-sized and small cities, the analysis shows that a CLEC would have a reasonable business case for deploying fiber.[14] In fact, Windstream is actively deploying fiber in such cities.[15] Mr. Gordon also notes that CenturyLink provides Windstream with much lower wholesale Ethernet rates than it assumes in its analysis.

Aside from the problems noted by Mr. Gordon and in the USTelecom filing, Windstream's study rests on a fundamental misconception of the special access marketplace. Essentially, Windstream appears to contend that special access is a natural monopoly in most locations and that the only way to ensure the availability of competitive alternatives to ILEC services is to regulate ILECs as monopoly providers. Both of these arguments are false.

ILECs are in no way dominant in the special access marketplace. As CenturyLink has previously explained, the 2013 data collection showed that non-ILEC providers have deployed competitive facilities in nearly all census blocks, and that those census blocks contain nearly all business customers.[16] And, since that data collection, less-regulated cable operators have accelerated their investment in and deployment of retail and wholesale Ethernet services.[17] In CenturyLink's ILEC footprint, cable operators now serve **[BEGIN HIGHLY CONFIDENTIAL]** [redacted] **[END HIGHLY CONFIDENTIAL]** of Ethernet customers, and their share of Ethernet customers and revenues continues to grow.[18] On the wholesale side, cable operators now offer wholesale Ethernet access **[BEGIN HIGHLY CONFIDENTIAL]** [redacted]

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[14] *See id.*

[15] *See* Sean Buckley, Fierce Telecom, *Windstream Enhances Ethernet Position By Expanding On-Net Fiber, Network Partnerships*, http://www.fiercetelecom.com/story/windstream-enhances-ethernet-position-expanding-net-fiber-network-partnersh/2016-03-01, at 1 (Mar. 1, 2016) (*Windstream Expanding On-Net Fiber*) (noting that Windstream is expanding its fiber network in Charlotte, N.C., and is planning additional network builds in Tennessee and Virginia). Windstream plans "to roll out additional markets and continue to enrich those markets with a fiber backbone[,]" as part of its product and access strategy. *See id.* (quoting Mike Kozlowski, Windstream VP of Product Management).

[16] *See* Comments of CenturyLink, WC Docket No. 05-25, RM-10593, at 5-11 (filed Jan. 28, 2016).

[17] *See* Letter from Melissa Newman, CenturyLink, to Marlene H. Dortch, FCC, WC Docket Nos. 05-25, 15-247, RM-10593 (filed Apr. 7, 2016).

[18] *Id.* at 4.

[redacted] **[END HIGHLY CONFIDENTIAL]** And, Windstream recently acknowledged that it is using fixed wireless services for its Ethernet services to avoid the need for a fiber build or wireline access altogether.[20]

Thus, CLECs such as Windstream can now choose to direct a high percentage of their demand for special access services to cable and other non-ILEC providers, or over their own wireline or wireless assets, as they have repeatedly told CenturyLink in negotiations seeking further discounts on CenturyLink's wholesale Ethernet and DSn services. CenturyLink therefore believes that Windstream cannot credibly say that it does not have competitive alternatives for most of its special access demand.

It also must be emphasized that ILEC fiber facilities are far from ubiquitous. For CenturyLink, **[BEGIN HIGHLY CONFIDENTIAL]** [redacted] **[END HIGHLY CONFIDENTIAL]** of the fiber-based Ethernet circuits it provides require construction. Thus, the Windstream study's premise that the ILEC is always the first entrant into a building—thus reducing a potential CLEC entrant's revenue opportunities—is not correct for fiber-based Ethernet services for the majority of locations in CenturyLink's ILEC footprint. Further, Windstream's cost study readily acknowledges that the price a carrier can charge for Ethernet (and the resulting revenues) has a direct impact on its incentive to build the facilities necessary to provide the Ethernet service. This principle applies just as much to CenturyLink, as an ILEC, in all but the less than **[BEGIN HIGHLY CONFIDENTIAL]** [redacted] **[END HIGHLY CONFIDENTIAL]** buildings in its ILEC footprint to which it has deployed fiber. If it cannot recover its cost of construction, it cannot rationally spend the capital necessary to deploy those facilities. In such case, absent CLEC facilities, there may be only one wire into the building (*i.e.*, cable). The Commission should therefore be careful to avoid policies that stunt ILEC incentives to deploy the fiber facilities necessary for the fastest business broadband services.

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[19] [redacted]

[20] *See Windstream Expanding On-Net Fiber* at 1. "Windstream uses [its] fixed wireless assets to deliver wireless-based Ethernet and MPLS-based services in various markets including Chicago, New York City, northern New Jersey and Milwaukee. *Id.* According to Windstream's VP of Product Management, "building fiber is pretty expensive, but fixed wireless affords us an opportunity . . . to create a higher complement for our customers in that we can sell diverse solutions. . . . It allows us a great opportunity to edge out the network and what's exciting is we have EoC [Ethernet-over-Copper], EoTDM [Ethernet-over-TDM], fiber-fed services and also have fixed wireless service." *Id.* (quoting Mike Kozlowski, Windstream VP of Product Management).

Special Access Price Reductions Will Reduce Necessary Fiber Deployment. In short, Windstream's cost study confirms the unsurprising fact that fiber deployment is costly and frequently economically irrational—whether the provider is a CLEC, cable operator, or ILEC—and that Commission regulation can dampen incentives to invest even further. No provider can justify deployment if the cost of that deployment exceeds the revenues it can expect from that deployment. Whatever Windstream's cost study stands for, it cannot support the proposition that special access rates are too high and need to be reduced or subjected to further regulation. On the contrary, as NCTA has noted, reductions in prices for business data services will actually reduce incentives for cable operators and other competitive providers to deploy the fiber necessary to provide those services.[21] The same is true for fiber deployment by CenturyLink and other ILECs. The Commission thus can best serve the public interest by declining to impose additional regulation on ILEC business data services.

Consistent with the nature of the Highly Confidential Information enclosed with this submission, the non-redacted version is marked pursuant to the *Special Access Rulemaking Second Protective Order*, as "**HIGHLY CONFIDENTIAL INFORMATION – SUBJECT TO PROTECTIVE ORDER IN WC DOCKET NO. 05-25, RM-10593 BEFORE THE FEDERAL COMMUNICATIONS COMMISSION -- ADDITIONAL COPYING PROHIBITED**". This Highly Confidential Information is very competitively sensitive commercial information and thus should not be available for public inspection. Such information also would not ordinarily be made available to the public. Release of the Highly Confidential Information would have a substantial negative competitive impact on CenturyLink. Accordingly, the submitted Highly Confidential Information is appropriate for non-disclosure pursuant to the *Special Access Rulemaking Second Protective Order*, and under FOIA and sections 0.457(d) and 0.459 of the Commission's rules (as detailed in the attached Confidentiality Appendix).

Consistent with the *Special Access Rulemaking Second Protective Order*, CenturyLink is filing one hard copy of its non-redacted submission with the Office of the Secretary and providing two hard copies of its non-redacted submission to the staff of the Wireline Competition Bureau (Marvin Sacks).

CenturyLink is also filing today via the Commission's Electronic Comment Filing System (ECFS) a redacted version of its submission. Consistent with the *Special Access Rulemaking Second Protective Order*, the redacted version of CenturyLink's filing, in which the Highly Confidential Information is omitted, is marked, "**REDACTED – FOR PUBLIC INSPECTION**".

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[21] *See* Letter from Steven F. Morris, NCTA, to Marlene H. Dortch, FCC, WC Docket No. 05-25, at 1-2 (Mar. 22, 2016).

The text of this letter and the attached Confidentiality Appendix are the same for both the non-redacted and redacted versions except for the omission of the Highly Confidential Information, the confidentiality markings and the manner of submission noted in the heading on the initial page.

Pursuant to Section 1.1206(b) of the Commission's rules, a copy of this ex parte presentation is being filed in the appropriate dockets.

Sincerely,

/s/ Craig J. Brown

Enclosure

CONFIDENTIALITY APPENDIX

47 C.F.R. § 0.457

Certain information included with CenturyLink's April 7, 2016 letter and in the attached Declaration of Daniel R. Gordon is entitled to highly confidential treatment under 47 C.F.R. § 0.457, and the *Special Access Rulemaking Second Protective Order* in WC Docket No. 05-25, RM-10593.[22]

The types of Highly Confidential Information being submitted include: CenturyLink's wholesale rates available to Windstream; the portion of retail Ethernet customers captured by cable operators in CenturyLink's ILEC footprint; the percentage of fiber-based Ethernet circuits CenturyLink provides that require construction; and information relating to the number of buildings in CenturyLink's ILEC footprint to which it deploys fiber. Each of these types of information falls within at least one of the categories of information that the Commission designated as "Highly Confidential" in the *Special Access Rulemaking Second Protective Order*.

All of this information is highly sensitive commercial information regarding CenturyLink's business operations and product/service offerings (which is the type of Highly Confidential Information described in ¶ 6 as appropriate for non-disclosure to the public pursuant to the *Special Access Rulemaking Second Protective Order*). And, CenturyLink's customers and competitors may also consider some of the information to be proprietary and competitively sensitive. All of this highly confidential proprietary commercial information also is not routinely available from CenturyLink nor is it available for public inspection from the Commission and thus is protected from public availability under 47 C.F.R. § 0.457(d).

47 C.F.R. § 0.459

CenturyLink also considers the Highly Confidential Information submitted with its filing as protected from public disclosure pursuant to 47 C.F.R. § 0.459(b) as described as follows.

Information for which confidential treatment is sought

CenturyLink seeks highly confidential treatment for information included with its April 7, 2016 submission in WC Docket No. 05-25, RM-10593, which is highly sensitive commercial

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[22] 25 FCC Rcd 17725 (rel. Dec. 27, 2010).

information regarding CenturyLink's business operations and product/service offerings that is protected from public disclosure and availability.

Commission proceeding in which the information was submitted

The letter and attached Declaration of Daniel R. Gordon are being filed in WC Docket No. 05-25, RM-10593, *Special Access for Price Cap Local Exchange Carriers; AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*.

Degree to which the information in question is commercial or financial, or contains a trade secret or is privileged

The Highly Confidential Information included with CenturyLink's submission that it considers very commercially sensitive and proprietary includes: CenturyLink's wholesale rates available to Windstream; the portion of retail Ethernet customers captured by cable operators in CenturyLink's ILEC footprint; the percentage of fiber-based Ethernet circuits CenturyLink provides that require construction; and information relating to the number of buildings in CenturyLink's ILEC footprint to which it deploys fiber. All of this information is highly sensitive commercial information regarding CenturyLink's business operations and product/service offerings (which is the type of Highly Confidential Information described in ¶ 6 as appropriate for non-disclosure to the public pursuant to the *Special Access Rulemaking Second Protective Order*). And, CenturyLink's customers and competitors may also consider some of the information to be proprietary and competitively sensitive. All of this highly confidential proprietary commercial information also is not routinely available from CenturyLink nor is it available for public inspection from the Commission and thus is protected from public availability under 47 C.F.R. § 0.457(d).

Degree to which the information concerns a service that is subject to competition; and manner in which disclosure of the information could result in substantial competitive harm

The types of Highly Confidential Information included with CenturyLink's submission would generally not be subject to routine public inspection under the Commission's rules (47 C.F.R. § 0.457(d)), demonstrating that the Commission already anticipates that its release likely would produce competitive harm. The telecommunications services CenturyLink provides -- including the services that are at issue in the special access rulemaking proceeding -- are all competitive. The release of this highly confidential proprietary information would cause competitive harm by allowing competitors to become aware of sensitive commercial information regarding CenturyLink's business and internal operations, and the competitive markets in which CenturyLink operates. And, the release of information CenturyLink's customers consider to be proprietary and competitively sensitive could also cause the company competitive harm.

Measures taken to prevent unauthorized disclosure; and availability of the information to the public and extent of any previous disclosure of the information to third parties

CenturyLink has treated and treats certain sensitive commercial information disclosed in the letter and Declaration of Daniel R. Gordon as highly confidential, and has protected it from public disclosure.

Justification of the period during which CenturyLink asserts that the material should not be available for public disclosure

At this time, CenturyLink cannot determine any date on which the sensitive commercial information included with its submission should not be considered highly confidential.

Other information that CenturyLink believes may be useful in assessing whether its request for confidentiality should be granted

Under applicable FCC and court rulings, the information in question should be withheld from public disclosure. Exemption 4 of the Freedom of Information Act shields information that is (1) commercial or financial in nature; (2) obtained from a person outside government; and (3) privileged or confidential. The information in question satisfies this test.

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Declaration of Daniel Gordon

1. My name is Daniel R. Gordon. My business address is 600 New Century Parkway, New Century, Kansas. I am employed as a Manager of Economic Costing at CenturyLink. In that capacity, I am responsible for producing and reviewing regulatory cost models, performing geographic information system analysis, and conducting other analysis for CenturyLink Regulatory Operations. I have been employed by CenturyLink and its predecessor companies for 18 years, holding positions in Regulatory Operations and Wholesale Markets. The primary purpose of my declaration is to evaluate the validity of the building density used in a CostQuest cost study that Windstream submitted to the Commission and determine the impact to the study's cost estimates of using more realistic density values, based on publicly available information.[1] I also consider the accuracy of the wholesale Ethernet prices in the Windstream study.

Executive Summary

2. My analysis revealed two significant flaws in Windstream's white paper, relating

[1] *See* Letter from Jennie B. Chandra, Windstream, to Marlene H. Dortch, FCC, GN Docket No. 13-5, WC Docket Nos. 05-25, 15-1, RM-10593 (filed June 8, 2015) (Windstream June 8th Letter); *id.* Attachment A (Windstream Study). In that same filing, Windstream submitted a white paper analyzing changes in the cost of network deployment as technology transitions from TDM to IP. *See id.*, Attachment B. This Declaration does not address that second white paper.

to its assumptions regarding building density and wholesale Ethernet rates.[2] These flaws significantly undermine the validity of the paper's conclusions that it is not economically efficient for CLECs to deploy their own fiber and that wholesale Ethernet rates generally exceed retail Ethernet rates.

3. *Building Density*. In its white paper, Windstream updated a 2002 CLEC analysis of the cost of loop construction, in order to estimate the break-even point for a CLEC to deploy fiber today. Based on this analysis, Windstream concluded that a CLEC can profitably deploy fiber only if the customers in each building purchase more than 1 Gbps of capacity, and that it will generally be preferable for a CLEC to lease last-mile facilities than build them. But, while Windstream updated the costs of construction and associated electronics from the 2002 Study, it did not alter the 2002 Study's assumption that the hypothetical CLEC is constructing a 30-mile fiber ring to serve 20 commercial buildings. This is a significant omission, as the market for business data services has evolved considerably over the past 14 years. Based on my review of publicly available data, I believe that this assumption is not realistic today and causes Windstream to dramatically overestimate a CLEC's typical cost to deploy fiber to a building and exaggerates the demand necessary to justify such fiber construction.

4. Windstream's assumptions concerning the density of locations on the hypothetical ring are significantly lower than the densities found in typical business districts. Windstream

[2] Throughout this Declaration, all references to "density," whether phrased as building density, location density, business density, or customer density, refer to *building* density—the number of commercial buildings within 1/10th of a mile of the CLEC's fiber ring that potentially could be served over a mile of that ring. Thus, the fact that a particular commercial building houses multiple business customers has no impact on the computed building densities used in my analysis.

assumed that the hypothetical market in its white paper has 200 buildings, that the CLEC wins 10 percent (or 20) of those buildings, and that the CLEC serves those 20 buildings with a 30-mile ring. This yields a building density of 6.67 buildings per mile. However, my investigation revealed that the building density on an average CLEC fiber route in today's marketplace actually is about 22 customers per mile—or more than three times higher than that assumed by Windstream. The substitution of a more realistic density in Windstream's analysis causes the CLEC's computed per-building cost to drop precipitously, such that the CLEC's average per-building revenue would be more than adequate to recover the CLEC's construction costs. The same is true of the three representative markets I examined in the Pacific Northwest.

5. *Comparison of Wholesale and Retail Ethernet Rates.* Windstream also compared average retail pricing, as reported by Telogical, to average wholesale pricing, purportedly based on publicly available AT&T and CenturyLink pricing. However, even the discounted wholesale rates presumed in Windstream's white paper vastly exceed the CenturyLink rates available to Windstream. Substituting those rates in Windstream's analysis shows that the average retail rates in the analysis exceed CenturyLink's actual rates provided to Windstream.

Windstream's Methodology and Analysis

6. On June 8, 2015, Windstream filed two white papers prepared by CostQuest Associates analyzing the economics of last-mile fiber deployment to non-residential customers.[3] Windstream characterizes the first paper, which is the focus of my analysis, as a study that "models the monthly cost for a hypothetical efficient competitive local exchange carrier

[3] *See* Windstream June 8th Letter.

('CLEC') to build last-mile fiber facilities and associated IP electronics, and compares that cost against the revenue required to support a build-out decision and against the cost of leasing equivalent facilities from incumbent LECs ('ILECs')."[4] The paper uses the design and assumptions of a study submitted by AT&T in the *Triennial Review* proceeding in 2002,[5] "to estimate the break-even points for a CLEC to build its own fiber facilities to provide DS1 and DS3 service to business customers."[6] In particular, Windstream's cost model uses the parameters from the 2002 study "relating to the size of the fiber ring and the number of buildings—a 30-mile fiber ring that extends to 20 revenue-producing buildings with business customers."[7] According to Windstream, the cost model also updates cost and pricing factors using publicly available data, where possible, including inputs from the model employed by the Connect America Fund (CACM).[8]

7. Using this methodology and these assumptions, the Windstream Study estimated a monthly cost per building of $2,712 for Ethernet up to 1 Gbps, and a per-building cost of $2,994 for Ethernet from 1 Gbps to 10 Gbps.[9] The study then used these estimated monthly costs to conduct a "revenue hurdle analysis." That analysis concluded that, for the hypothetical

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[4] *Id.* at 2.

[5] *See* Letter from Joan Marsh, AT&T, to Marlene Dortch, FCC, CC Docket Nos. 01-338, 96-98, 98-147, Attachment B (filed Nov. 25, 2002) (2002 Study).

[6] Windstream June 8th Letter at 3.

[7] *Id.* at 3; Windstream Study at 4-5.

[8] Windstream June 8th Letter at 3. According to the Windstream Study, some of the assumptions in the study "were modified to incorporate today's CLEC practices (based on Windstream input) and current technologies and costs." Windstream Study at 3, 5.

[9] *See* Windstream Study at 6-7.

CLEC to break even, it would need one customer in each building to purchase more than 1 Gbps of capacity, or, alternatively, specified numbers of customers in each building to purchase lower capacity Ethernet circuits.[10]

8. The Windstream Study also compared the average retail Ethernet pricing observed by Telogical to the average and discounted wholesale Ethernet pricing used for the build-versus-buy analysis.[11] Based on this comparison, the study concluded that "leasing wholesale Ethernet access—even when it may be economically preferable to building—may not be a viable means for a CLEC to provide Ethernet service in some instances because retail Ethernet rates in the marketplace, based upon analysis of Telogical data, may be lower than the wholesale rates (even when a 50% discount is presumed) for many of the service speeds."[12] Given all this, the study further opined both that purportedly high wholesale rates may cause a CLEC not to offer Ethernet service at all, and that available wholesale rates are irrelevant to a CLEC's decision whether to build.[13]

9. Finally, the Windstream Study examined the sensitivity of unit cost to density and market share.[14] The study concluded that, "as business density increases, then at a given level of

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[10] *See id.* at 8-9. The Windstream Study also included a "build-versus-buy analysis," which purported to compare the hypothetical CLEC's estimated per-building monthly costs to its costs of leasing wholesale Ethernet services from an ILEC. *See id.* at 10.

[11] *See id.* at 11-12.

[12] *Id.* at 12.

[13] *See id.*

[14] *See id.* at 13. For purposes of this sensitivity analysis, the hypothetical CLEC's market share "represents the total number of locations in the market, assumed to be 200 locations, multiplied by the [CLEC's] business market share." *Id.*

market share (i.e., held constant), the average cost of a served building falls, and thus the revenue hurdle level also falls."[15]

CenturyLink's Methodology

10. My analysis focused primarily on the validity of one assumption in Windstream's analyses: that the hypothetical CLEC in the Windstream Study builds a 30-mile fiber ring to serve a potential market of 200 commercial buildings. In an effort to determine the accuracy of this assumption, I used publically available data on the metro fiber networks that Zayo has deployed in the U.S.,[16] as well as information from Equifax and GeoResults on customer locations and estimated monthly wireline telecom spend.[17] Otherwise, my analysis used the assumptions and inputs in the Windstream Study, including the costs of constructing fiber and deploying necessary electronics, the building rent, and CLEC market share.[18]

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[15] *Id.* at 14. Table 5 of the Windstream Study then presents the cost per customer location at different densities and market shares, assuming a potential market of 200 locations. The table highlights the baseline modeling assumption (that the CLEC serves 20 of the 200 potential locations with 1 Gpbs Ethernet on a 30-mile ring), which reflects a location density of 6.67 location per mile.

[16] Zayo's fiber route data may be found at: http://www.zayo.com/solutions/global-network/building-lists-kmz-files/ under the "US Network" link.

[17] The data are the combination of GeoResults National Business Database and the Equifax/Austin Tetra Business databases. A description of the GeoResults database may be found at http://www3.georesults.com/national-business-telecom-databases/. More information on Equifax databases may be found at http://learn.equifax.com/commercial/marketing_data_services/en_us.

[18] CenturyLink's use of Windstream's cost assumptions in this analysis should not be interpreted to mean that CenturyLink believes they are accurate. For example, the building rent in the Windstream Study appears to be higher than CenturyLink would expect. With that said, CenturyLink has used Windstream's cost assumptions in its analysis in order to focus on the reasonableness of Windstream's assumptions regarding potential location density.

11. Using this information, I then recalculated Windstream's per-building cost estimates and recomputed the revenue hurdle analysis in the Windstream Study, which uses Telogical retail price data. I also compared the recalculated monthly costs to publicly available data on average monthly wireline telecom spend, as another way of assessing whether it would be cost effective for the CLEC to deploy fiber. As a further check, I performed a similar analysis for three medium or small cities in Washington and Oregon. Finally, I compared Telogical's retail Ethernet rates, as presented in the Windstream Study, to CenturyLink's wholesale Ethernet rates actually available to Windstream. Each of these steps is explained in further detail below.

12. Zayo's fiber route data on its website are segregated into "metro" and "long haul" fiber. For this analysis, I used Zayo's data on metro fiber, which most closely correspond to the last-mile fiber facilities modeled in the Windstream Study.[19] To capture potential customers that would most likely be served by this fiber, given the lateral distances in the Windstream Study, I used Alteryx and MapInfo software applications to create a 1/10th of a mile buffer along Zayo's

[19] As stated in the Windstream Study, "[w]hile the original AT&T study included both loop and transport costs and revenues, this analysis focuses only on the last-mile costs from the customer location to the local service (LSO) (i.e., the loop) and excludes revenue and costs associated with the transport beyond the LSO. As such, costs to move data from LSO to LSO and costs to move data across markets are not included." *See* Windstream Study at 3-4 (footnote omitted). Windstream's website also appears to have data on its fiber facilities. *See Carrier Interactive Map*, Windstream website, http://carrier.windstreambusiness.com/interactive-map/. However, those data are not split between metro and long haul fiber, and Windstream's maps clearly show that its fiber is a combination of those types of fiber. As a result, I could not use the Windstream data to conduct the analysis I did with the Zayo data without underestimating the density of the last-mile fiber Windstream has deployed in metro areas.

metro fiber routes.[20] I also used this software to estimate the total route distance of the Zayo Fiber.

13. I then plotted the location information I obtained from the GeoResults/Equifax data to identify those locations within the 1/10th mile buffer. Only those business locations that fell within the buffer were included in the analysis. Using the telecom spend information, I categorized these locations into the following groups:

- $0-499.99 per month (equivalent to a few DS1s, or 10 Mbps Ethernet)
- $500-$999.99 per month (equivalent to 20-50 Mbps Ethernet)
- $1000-$1999.99 per month (equivalent to Ethernet up to 1Gbps)
- $2000+ (1Gbps Ethernet or higher bandwidth).

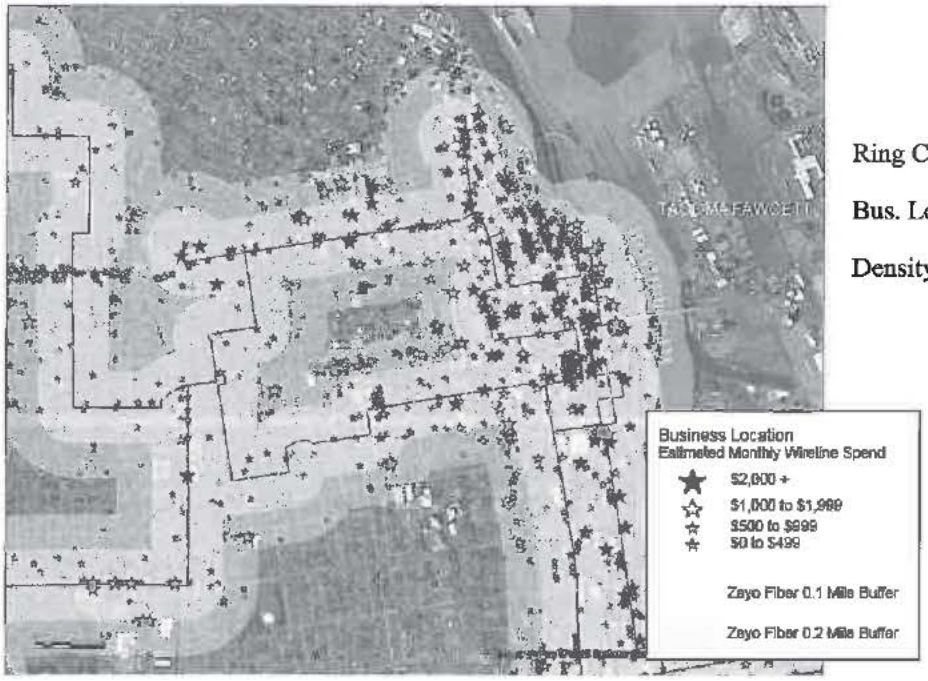
14. By summing these categories, I estimated the total number of buildings that potentially could be served by Zayo's fiber and the total monthly telecom spend in those buildings. From the fiber route data on Zayo's website, I computed the total route miles of the metro fiber rings that could serve those buildings. Finally, I calculated the location density (building locations per mile of fiber ring) by dividing the total building locations by the total miles of metro fiber.

[20] A description of MapInfo may be found at http://www.pitneybowes.com/us/location-intelligence/geographic-information-systems/mapinfo-pro.html. A description of Alteryx may be found at http://www.alteryx.com/. Of course, many more business locations exist beyond 1/10th of a mile of a CLEC's fiber ring. Even though the investment to construct laterals to those locations may be higher, increased density and opportunity will only improve a CLEC's economics of operating and maintaining a network if longer laterals that cover more customers.

15. I also performed a similar analysis for three markets in the Pacific Northwest—Tacoma, Washington; Salem, Oregon; and The Dalles, Oregon—to address potential concerns that the calculation of average location density might be skewed by especially high location density in the country's largest and most urbanized cities served by Zayo. I also chose these markets for further study because they reflect the diversity of areas within CenturyLink's ILEC footprint and to reflect that Zayo has fiber rings of varying distance in these markets.

16. With a population of approximately 205,000, Tacoma is the 107th largest city in the U.S.[21] Zayo has overbuilt much of this city with multiple fiber rings. My analysis used a short (i.e., 5-mile) ring that Zayo deployed to serve a portion of Tacoma, as shown in Figure 1. The green area in Figure 1 (as well as in Figures 2 and 3) represents the 1/10th mile service buffer around Zayo's fiber.

[21] *Annual Estimates of the Resident Population for Incorporated Places of 50,000 or More, Ranked by July 1, 2014 Population*, Census Bureau website, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk.



Ring Circumference: 5 miles

Bus. Locations in Buffer: 550

Density: 137.5 Locations/mile

Figure 1: Zayo's "Short Ring" in Tacoma, Washington

17. Salem is the 152nd largest U.S. city, with a population of 162,000.[22] It is also the capital of Oregon. Salem provides an example of a relatively long ring (i.e., 51 miles) that is closer to that assumed in the Windstream study, as shown in Figure 2.

[22] *See id.*

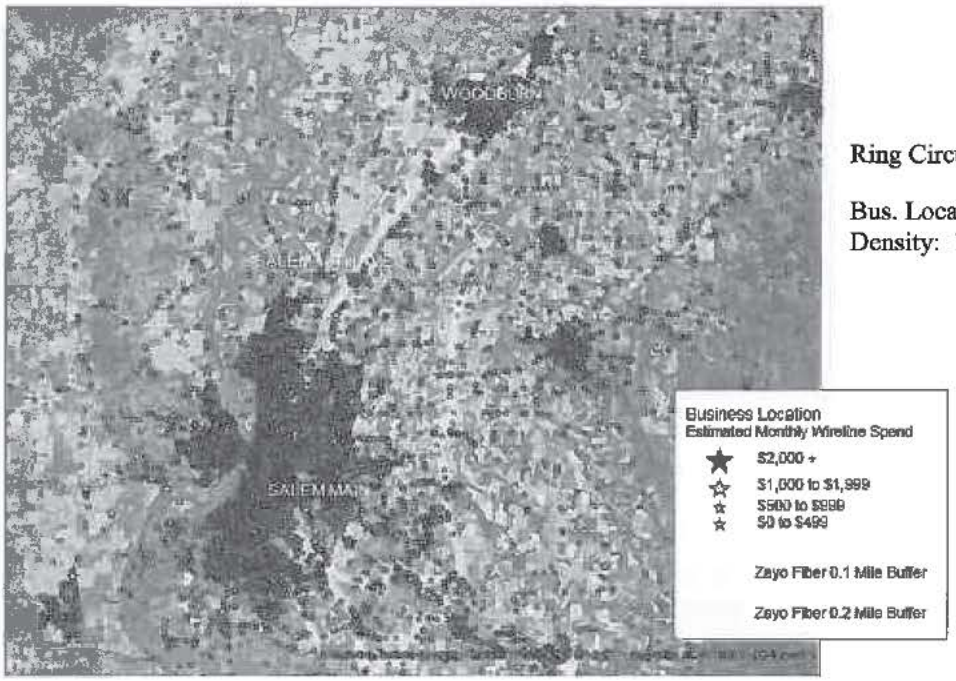


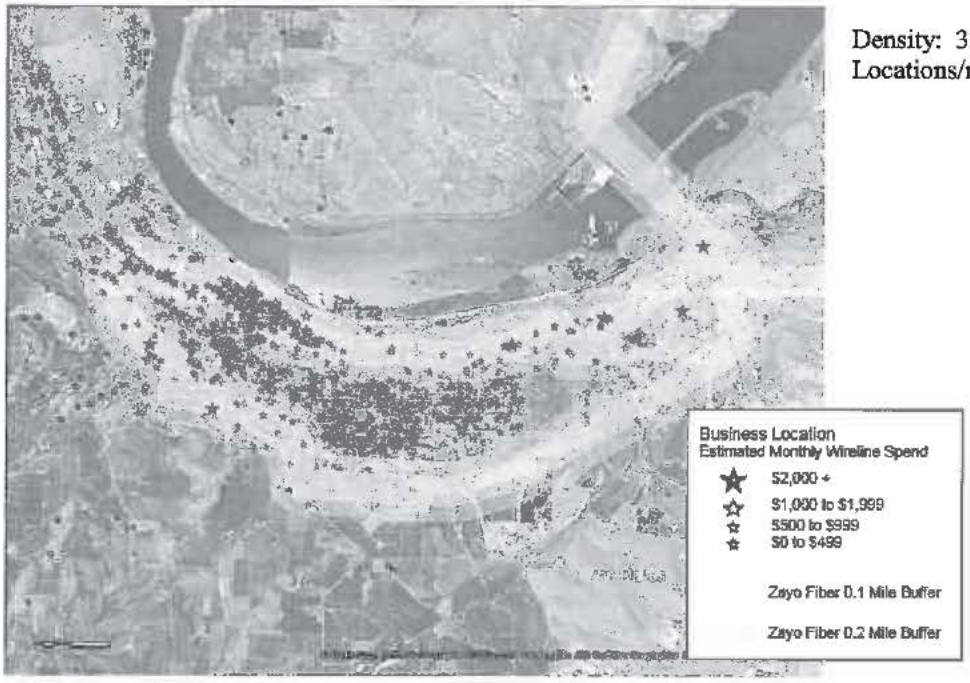
Figure 2: Zayo's "Long Ring" in Salem, Oregon

18. The Dalles is a city of approximately 14,000 residents, situated in the north-central part of Oregon on the Columbia River.[23] Zayo has deployed a medium-sized (i.e., 11-mile) ring there, as shown in Figure 3.

[23] *See History and Geography*, City of The Dalles website, http://www.thedalles.org/historygeo.htm.

Ring Circumference: 11 miles

Bus. Locations in buffer: 370



Density: 33.6 Locations/mile.

Figure 3: Zayo's "Medium Ring" in The Dalles, Oregon

19. For each of these markets, I computed the location density (*i.e.*, buildings per ring mile) for the customers that potentially could be served by the Zayo ring (*i.e.*, those in the 1/10 mile buffer around the ring). I then calculated the per-building costs of operating the fiber network in those markets, using the other assumptions and inputs in the Windstream Study. Throughout my analysis, I used the Windstream Study's assumptions for building penetration (*i.e.*, market share), fiber cost, lateral distance,[24] and electronics cost,[25] to calculate average

[24] The Windstream Study assumed a lateral distance of 500 feet. Despite the fact that the 1/10th mile buffer created a maximum distance of 528 feet from fiber to building, 500 feet was kept as the average because some locations will be closer than the full buffer distance and some will

investment per location across Zayo's metro fiber and the individual rings in the three markets. To maintain consistency of expense impacts, I calculated the percentage difference in investment per location, as compared to that in the Windstream Study, and then applied it to the Windstream Study's cost per location. Thus, the only material changes made to Windstream's analysis were density of businesses per mile and ring distance.

20. Finally, I examined the Windstream Study's comparison of retail and wholesale Ethernet rates. As noted, that comparison uses a purported average of AT&T and CenturyLink wholesale rates, with and without an assumed 50% volume discount.[26]

Results of CenturyLink Analysis

21. *Density and Expected Revenues*. The Windstream Study acknowledges that "the business density in the target market . . . [has] a significant impact on the cost analysis. If the CLEC adds more locations onto the ring, the average cost per served location drops, and thus the revenue hurdle drops."[27] The study also includes a table illustrating the way in which per-location cost depends on both density (in the form of ring size) and CLEC market share.[28] But that table, and the Windstream Study generally, assumes that the number of potential business

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require laterals longer than 500 feet. Under Windstream's assumptions, 28 feet of lateral fiber equates to $224.84 of investment, or about 0.2 percent of Windstream's investment per location, which would be immaterial to the cost per location.

[25] Using the redacted version of the Windstream Study, I backed into an approximation of the average electronics per location. Because the central office electronics investment is fixed for a large group of customers and is built into the average cost per unit, the cost per unit is actually overstated in my analysis, making the resulting cost estimates conservatively high.

[26] *See* Windstream Study at 12.

[27] Windstream Study at 9.

[28] Windstream Study at 15, Table 5.

locations is fixed at 200 locations. With a 10 percent market share, this results in the hypothetical CLEC serving only 20 locations on its 30-mile ring. Based on my analysis of publicly available data, I believe that this 200-location assumption is unreasonably low and results in per-location costs that are much higher than CLECs encounter in the real world, as I discuss in more detail below.

22. Notably, the Windstream Study gives no justification for assuming that the hypothetical CLEC is serving 20 locations with a 30-mile ring other than that is what was used in another CLEC study 14 years ago, and thus "enables a consistent baseline for considering changes to network deployment costs."[29] By doing so, the Windstream Study failed to account for the possibility that dramatic changes in the special access marketplace—including exploding demand for bandwidth from all types of business customers—has expanded the addressable market that can be served by a CLEC fiber ring, as compared to 2002. Similarly, the Windstream Study ignored the fact that the 2002 Study focused on the cost of deploying DS1s and DS3s, rather than the wide range of Ethernet capacities (and prices) assumed in the Windstream Study. The 2002 Study focused on "the very largest customer locations (in terms of service demand)[,]" which it defined as 3 DS3s of demand—a "high volume" for that time.[30] Clearly the special access marketplace looks very different today, with a much larger pool of potential Ethernet customers that could be served by a CLEC fiber ring.[31] That fact is confirmed

[29] *See* Windstream Study at 3.

[30] *See* AT&T Study at 1-2.

[31] My analysis focused solely on traditional business locations, even though fiber rings now carry large volumes of revenue-generating traffic from other types of customer locations not included

by my analysis. Because the Windstream Study underestimated the density of buildings in metro areas–the areas where customers for special access will most likely be found–the study greatly overstated the cost per building of deploying a fiber ring.

23. The Windstream Study's assumption of a 30-mile ring to serve an area with 200 potential customer locations results in a density of 6.67 buildings per mile.[32] But, based on my analysis of Zayo's metro fiber data and as shown in Table 1, the actual density faced by a CLEC is approximately 22 buildings per mile—or about three times the assumption in the Windstream Study.

24. Available data also reflect significant revenue potential for a CLEC deploying a fiber ring, even when just considering traditional wireline business customers. According to the monthly spend data from GeoResults, each business location is worth $1,730 per month. The combination of high spend value and higher density in reality demonstrates ample opportunity for CLECs to recover the cost of constructing and maintaining a fiber network.

Table 1: Summary of Zayo Metro Fiber Distance and Building Density

in my analysis, such as wireless cell sites and data centers. For that reason, a CLEC's actual business case will likely be much better than that reflected in my analysis.

[32] *See* Windstream Study at 15, Table 5.

Estimated Monthly Wireline Telecom Spend Range	Business Locations within 1/10th of a Mile of Fiber	Estimated Monthly Wireline Telecom Spend	Density (Locations/ Mile)	Estimated Monthly Wireline Telecom Spend per Location
Fiber Route Distance (Miles)			33,689	
$0-$499.99	513,748	$ 102,419,595	15.2	$ 199
$500-$999.99	92,468	$ 65,217,718	2.7	$ 705
$1000-$1999.99	62,024	$ 86,888,675	1.8	$ 1,401
$2000+	82,436	$ 1,044,426,719	2.4	$ 12,670
Total	750,676	$ 1,298,952,707	22.3	$ 1,730

25. *Per-Building Cost.* With a building density of 22 locations per mile, a CLEC that wins 10 percent of the locations passed by its 30-mile ring would actually serve 66 building locations across which it could spread the costs of its fiber deployment, rather than the 20 locations assumed in the Windstream Study. Not surprisingly, this adjustment to the Windstream analysis significantly reduces the CLEC's per-building cost of deployment. Windstream's 20-location assumption resulted in a per-building cost of $2,712 per month for 1 Gbps capacity per building and $2,994 per month for up to 10 Gbps of capacity at each location.[33] But, with a more realistic assumption that the 30-mile ring serves 66 locations, the per-building cost is reduced to $1,021 per month for 1 Gbps capacity per building and $1,317 per month for up to 10 Gbps of capacity per building, as shown in Table 2.

Table 2: Analysis of 30-Mile Ring with Average Building Density

[33] Windstream Study at 7.

Network Component	Windstream Assumptions Quantity	Windstream Assumptions Capital	Updated Ring Quantity	Updated Ring Capital
Location Penetration	No change from whitepaper		10%	
Locations	No change from whitepaper			
Ring Circumference	No change from whitepaper			
Locations per Mile	0.67		22	
Building Ring (miles)	30	$ 2,082,446	30	$ 2,082,446
Building Lateral (quantity)	20	$ 80,281	66	$ 264,927
Premises if 1 GBPS		$ 164,530		$ 542,949
Premises if 10 GBPS		$ 428,529		$ 1,414,146
CO Electronics				
Total if up to 1Gpbs in each building		$ 2,327,257		$ 2,890,322
Total if up to 10Gpbs in each building		$ 2,591,256		$ 3,761,519
Per building, Ethernet if up to 1Gbps	20	$ 116,363	66	$ 43,793
Per building, Ethernet if up to 10Gbps	20	$ 129,563	66	$ 56,993
Change From Windstream Analysis				
1Gbps		0%		-62%
10Gbps		0%		-56%
Estimated Cost (all other things equal)				
1Gbps		$ 2,712		$ 1,021
10Gbps		$ 2,994		$ 1,317
Average Telecom Spend per month per Location (All) from Equifax/GeoResults				
Estimated Montly Telecom Spend/Location		$ 1,730		$ 1,730
Profit per Location @ 1Gbps		$ (982)		$ 709
Profit per Location @ 10Gbps		$ (1,264)		$ 413

26. The results of my analysis were similar for the three Pacific Northwest markets I studied. First, for the short ring in Tacoma, there were 550 buildings in the 1/10th mile buffer around this 5-mile ring, resulting in a building density of 137.5 buildings per mile.[34] With this increased density, the investment per location dropped by 75 and 84 percent, respectively, as compared to that in the Windstream Study for 1 Gpbs and 10 Gbps capacity. Applying these

[34] With the 10 percent market share assumption in the Windstream Study, this means that the hypothetical CLEC would serve 55 of those buildings using its fiber ring.

differences to the costs in that study produced a monthly cost of $432 per month for 1 Gbps and $734 per month for 10 Gbps, as shown in Table 3.

Table 3: Analysis of Short Ring in Tacoma

	Windstream Assumptions		Short ring - Tacoma		Description		
Network Component	Quantity	Capital	Quantity	Capital	Quantity	Capital	Notes
Location Penetration	No change from whitepaper		10%				
Locations	No change from whitepaper		550				
Ring Circumference	No change from whitepaper		5				
Locations per Mile	0.67		110				
Building Ring (miles)	30	$ 2,082,446	5	$ 347,074	Ring's circumference.	Ring Miles*5280*$13.14/foot	Fiber cost is from Windstream's analysis.
Building Lateral (quantity)	20	$ 80,281	55	$ 220,773	Penetration*Miles*Locations per Mile	Laterals*500*$8.03/foot	Fiber cost is from Windstream's analysis.
Premises if 1 GBPS		$ 164,530		$ 452,458	Estimated from Whitepaper	$8,226.50*Laterals	Estimated from Whitepaper.
Premises if 10 GBPS		$ 428,529		$ 1,178,455	Estimated from Whitepaper	$21,426.45*Laterals	Estimated from Whitepaper.
CO Electronics					Included Above		Allocation estimated from Whitepaper.
Total if up to 1Gbps in each building		$ 2,827,257		$ 1,020,305		Sum of Ring, Lateral, and 1Gb Premises Investment	
Total if up to 10Gbps in each building		$ 2,591,256		$ 1,746,302		Sum of Ring, Lateral, and 10Gb Premises Investment	
Per building, Ethernet if up to 1Gbps	20	$ 116,363	55	$ 18,551		Total 1Gb Capital/laterals	
Per building, Ethernet if up to 10Gbps	20	$ 129,563	55	$ 31,751		Total 10Gb Capital/laterals	
Change From Windstream Analysis							
1Gbps		0%		-84%	(Updated Investment per Location - Windstream Investment per location)/Windstream Investment per Location		
10Gbps		0%		-75%			
Estimated Cost (all other things equal)							
1Gbps		$ 2,712		$ 432	(Change from Windstream Analsysis * Windstream's cost result)		
10Gbps		$ 2,994		$ 734			
Average Telecom Spend per month per Location (All) from Experian							
Estimated Montly Telecom Spend/Location		$ 1,730		$ 1,730	Total Estimated Monthly Wireline Telecom Spend / Total Locations		
Profit per Location @ 1Gbps		$ (982)		$ 1,298	(Monthly Telecom Spend per Location - Estimated Cost Per Location)		
Profit per Location @ 10Gbps		$ (1,264)		$ 996			

27. The results for the longer ring in Salem were similar, though less pronounced. My analysis estimated 736 customer locations in the 1/10th mile buffer around the 51-mile ring, yielding a density of 14.4 locations per mile. This resulted in a reduction of the investment calculated in the Windstream Study by 43 and 48 percent, respectively, for 1 Gbps and 10 Gbps capacity per building. With this reduced investment, the monthly cost of service in this market was $1,406 and $1,699 in each building for 1 Gbps and 10 Gbps capacity, respectively, as reflected in Table 4. For the medium ring in The Dalles, there were 370 business locations in the buffer around the 11-mile ring, resulting in a density of 33.6 buildings per mile. With this

updated density, the investment fell by 64 and 72 percent for 1 Gbps and 10 Gbps, respectively, resulting in monthly per-building costs of $766 and $1,065 for these capacities, as also shown in Table 4.

Table 4: Analysis of Long and Medium Rings in Salem and The Dalles

	Windstream Assumptions		Medium Ring - The Dalles		Long Ring - Salem		Average Zayo Ring	
Network Component	Quantity	Capital	Quantity	Capital	Quantity	Capital	Quantity	Capital
Location Penetration	No change from whitepaper		10%		10%			
Locations	No change from whitepaper		370		736			
Ring Circumference	No change from whitepaper		11		51			
Locations per Mile	0.67		34		14			
Building Ring (miles)	30	$ 2,082,446	11	$ 763,564	51	$ 3,540,158	22	$ 1,550,265
Building Lateral (quantity)	20	$ 80,281	37	$ 148,520	74	$ 295,434	55	$ 221,576
Premises if 1 GBPS		$ 164,530		$ 304,381		$ 605,470		$ 454,103
Premises if 10 GBPS		$ 428,529		$ 792,779		$ 1,576,987		$ 1,182,740
CO Electronics								
Total if up to 1Gpbs in each building		$ 2,327,257		$ 1,216,464		$ 4,441,063		$ 2,225,944
Total if up to 10Gpbs in each building		$ 2,591,256		$ 1,704,862		$ 5,412,579		$ 2,954,581
Per building, Ethernet if up to 1Gbps	20	$ 116,363	37	$ 32,877	74	$ 60,341	55	$ 40,325
Per building, Ethernet if up to 10Gbps	20	$ 129,563	37	$ 46,077	74	$ 73,540	55	$ 53,525
Change From Windstream Analysis								
1Gbps		0%		-72%		-48%		-65%
10Gbps		0%		-64%		-43%		-59%
Estimated Cost (all other things equal)								
1Gbps		$ 2,712		$ 766		$ 1,406		$ 940
10Gbps		$ 2,594		$ 1,065		$ 1,699		$ 1,237
Average Telecom Spend per month per Location (All) from Equifax/GeoResults								
Estimated Montly Telecom Spend/Location		$ 1,730		$ 1,730		$ 1,730		$ 1,730
Profit per Location @ 1Gbps		$ (982)		$ 964		$ 324		$ 790
Profit per Location @ 10Gbps		$ (1,264)		$ 665		$ 31		$ 493

28. *Revenue Hurdle Analysis*. Using these adjusted costs, I also replicated the revenue hurdle analysis in the Windstream Study. The Windstream Study concluded that, in order for the CLEC to break even, each building on the ring would have to generate at least $2,712 in monthly recurring revenue, corresponding to more than 1 Gbps of capacity, using

Telogical retail price data.[35] But, with the adjusted cost estimates from my analysis, on average, the CLEC would only need $1,021 in revenues per building, which corresponds to a per-building capacity of only 50 Mbps, using the Telogical retail prices. For the Tacoma ring, the customer(s) in each building would need to purchase, on average, only slightly more than 10 Mbps capacity,[36] and in Salem and The Dalles, each building would need to generate, on average, slightly more than 100 Mbps and 20 Mbps, respectively.[37] Comparing the computed costs to the average monthly telecom spend of $1,730 noted above also clearly shows that it is cost efficient for a CLEC to deploy its own fiber in each of these areas, as shown in Table 4.

29. *Comparison of Retail and Wholesale Ethernet Rates.* The Windstream Study's comparison of wholesale and retail Ethernet rates also is misleading, at least with respect to the wholesale rates available from CenturyLink. According to Table 3 in the Windstream Study, even with a 50% discount, the average of AT&T's and CenturyLink's wholesale Ethernet rates are higher than average retail rates (as compiled by Telogical) at most speeds.[38] For completeness, Table 5 compares the Telogical average retail prices to the wholesale Ethernet rates CenturyLink currently charges Windstream. All the wholesale rates CenturyLink provides

[35] *See* Windstream Study at 8.

[36] According to the Telogical pricing cited in the Windstream Study, the average retail price for a 10 Mbps circuit is $427, Windstream Study at 12, which is only slightly less than the $432 per-building cost in Tacoma for 1 Gbps capacity at each location.

[37] According to the Telogical pricing, the average retail price for a 100 Mbps Ethernet circuit is $1,196 (as compared to a per-building cost of $1,406 in Salem) and for a 20 Mbps Ethernet circuit is $616 (as compared to a per-building cost of $766 in The Dalles). *See* Windstream Study at 12.

[38] *See* Windstream Study at 12, Table 3.

to Windstream are lower than both the 50% discounted rates in the Windstream Study and the Telogical retail prices. Because those wholesale rates that Windstream quotes are incorrect, Windstream's conclusions about the need for further rate regulation are misplaced. Over time, CenturyLink has reduced the Ethernet rates provided to Windstream in response to competition from CLECs and cable operators.

Table 5: Comparison of Telogical Retail Rates and CenturyLink Wholesale Rates Available to Windstream

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Conclusion

30. By assuming that the hypothetical CLEC will deploy a 30-mile ring to serve 20 customer locations, the Windstream Study significantly underestimates the business density that a CLEC will encounter in the real world and overestimates the per-building cost of deploying a CLEC fiber ring. Adjustment of density to reflect real-world conditions demonstrates that CLECs can (and do) profitably deploy fiber rings to serve special access customers in cities of all sizes. This adjustment to the density assumption and the wholesale Ethernet rates available to Windstream also confirm that no further regulation of ILEC Ethernet services is required.

/s/ _____

April 7, 2016